CUMULATIVE INDEX 1998

Volume 18

March	FORENSIC PATHOLOGY, PART I, pages 1–187
June	FORENSIC PATHOLOGY, PART II, pages 189–356
September	FINE NEEDLE ASPIRATION, pages 357–613
December	TOXICOLOGY, pages 615–826

Note: Page numbers of article titles are in **boldface** type.

Aagenes syndrome, copper metabolic defects in, 676
Abdomen, radiology of, in forensic pathology, 221
  rifle wounds of, 193
Abrasions, examination of, 340–341
Abscess, cerebral, in head trauma, 58–59
  kidney, fine needle aspiration of, 434–435
Abuse, child, head trauma in, 58–59
  forensic radiology in, 225–231
    child, 225–229
    elder, 230
    human rights, 230–231
    spousal, 227, 230
Accreditation, in forensic toxicology, 264–267
Achille Lauro hijacking, murder in, 109
Acid, as adulterant, in urine drug testing, 796
Acinar cells, fine needle aspiration of, 404
Acrodermatitis enteropathica, zinc deficiency in, 679
Adenocarcinoma, fine needle aspiration of, 364–365
    bronchogenic, 383–384
    kidney, 448
    liver, 499–503
    lung, 368–369, 383–384
    pancreas, 407–409
      poorly differentiated, 410–412
      undifferentiated, 412
      well-differentiated, 410
    salivary glands, 382–383
Adenoma, fine needle aspiration of,
    adrenal, 450–451
    lung, 384
    parathyroid glands, 465
Adenomatoid goiter, fine needle aspiration of, 467–468
Adenosquamous carcinoma, pancreas, fine needle aspiration of, 412
Adipose tissue tumors, fine needle aspiration of, 508–513
Adobe Photoshop software, 592–593
Adrenal gland, fine needle aspiration of, **448–457**
    adenoma, 450–451
    carcinoma, 451–452
    contraindications for, 430
    cryptococcosis, 457
    cyst, 456
    echinococcosis, 457
    ganglioneuroblastoma, 455
    ganglioneuroma, 455
    histoplasmosis, 457
    hyperplasia, 456–457
    indications for, 429–430
    metastasis, 455–456
    myelolipoma, 449–450
    neuroblastoma, 454–455
    normal cytology, 448–449
    oncocytoma, 456
    pheochromocytoma, 452–454
Adulterants, in urine drug testing, 272–273, 795–796
  of drugs, analytical result effects of, 720–721
Aganglionosis, colonic, sudden death in, 329
Age determination, from dental examination, 121

Age determination *(Continued)*
from skeletal examination, 124
in forensic radiology, 209–210, 212–213
Aging, of face, computer graphics programs for, 74
Air embolism, forensic pathology in, 247–348
Air pollution, health effects of, 768
Air-blast injuries, 100
Aircraft accidents, bombings, 103–108
mass casualties in, radiologic identification in, 221–222
terrorist bomb ruled out in, 110–111
Airport, shootings at, 111
Alcohol ingestion, brain injury in, 46
hypothermia in, 86, 88
Aldehyde oxidase, molybdenum and, 681
Aluminum encephalomyelopathy, experimental, **687–698**
aluminum chemistry and, 688–689
amyotrophic lateral sclerosis and, 693–694
immunochemical considerations in, 691–692
laboratory tests in, 694–695
pathology of, 689–690
stock solution instability and, 688–689
ultrastructural considerations in, 690–691
Alveolar capillary dysplasia, in pediatric patients, sudden death in, 328
Alveolar soft part sarcoma, fine needle aspiration of, 533–535
Alzheimer's disease, animal models of. See *Aluminum encephalomyelopathy, experimental.*
American Academy of Forensic Examiners news-group, 94
American Academy of Forensic Sciences, professional practice standards of, 633–634
toxicology guidelines of, 264–276
American Board of Forensic Toxicology, accreditation by, 266–267
Amino acids, metabolic disorders of, sudden death in, 330
Amniotic fluid embolism, forensic pathology in, 246–247
Amphetamines and amphetamine analogues, as recreational drugs, 737–744
testing for, gas chromatography-mass spectrometry in, 642–644
in psychiatric outpatient service, 719
Amplified fragment length polymorphism analysis, in forensic pathology, 72
in postmortem identification, 129–130
Amyloid deposition, in Alzheimer's disease, 692
Amyotrophic lateral sclerosis, copper metabolic defects in, 676
pathology of, aluminum and, 693–694
Anaplastic carcinoma, thyroid gland, fine needle aspiration of, 474–475
Anaplastic large cell lymphoma, fine needle aspiration of, 556–558
Aneurysms, brain, in pediatric patients, sudden death in, 328
Angiomyolipoma, kidney, fine needle aspiration of, 432–433
Angiosarcoma, fine needle aspiration of, 531
Animal models, of Alzheimer's disease. See *Aluminum encephalomyelopathy, experimental.*
Animal remains, radiology of, 209
Animations, computer, in forensic pathology, 177–178
Anthropologic parameters, in forensic radiology, 208–215
age, 209–210, 212–213
animal versus human, 209
population ancestry, 211, 214
race, 211, 215
sex, 210–211
stature, 211
in postmortem identification, 123–125
Aortic disorders, sudden death in, 325
Archiving, image processing for, 157–158
Arrest, death during. See *Death, in custody.*
Art forgeries, forensic radiology in, 234
Arteriovenous malformations, of brain, in pediatric patients, sudden death in, 328
Asbestos-related disease, forensic pathology in, 254–258
Asphyxia, in neck compression, 12
restraint, death in, 13–15
Aspiration, fine needle. See *Fine needle aspiration.*
Asplenia, sepsis in, in pediatric patients, sudden death in, 333
Assault rifle wounds, 199–201
Asthma, forensic pathology in, 248
sudden death in, 328
Atmospheric pressure chemical ionization technique, in forensic toxicology, 273–274
Atomic absorption spectrometry, in trace element analysis, 616–618
Atomic emission spectrometry, in trace element analysis, 618–619
Automated fingerprint identification system, 66–68, 120
Autopsies, alternatives to, 24
declining rate of, 23–25
identification in. See *Postmortem identification.*

in cold-related deaths, 87–88
in death in custody, 2–3
in neck compression, 10–11
in epidemiologic research, 23–25
in heat-related deaths, 83–84
in terroristic attacks. See *Terrorism.*
litigation involving. See *Litigation, against medical examiners.*
medicolegal, current trends in, 280
historical review of, 281–283
in injuries, blunt, 343–344
sharp, 348–349
pediatric, 323–325
personnel requirements for, 303
problems obtaining, 284
procedure for, 308–310
versus hospital autopsy, 308–309
Autoradiography, in forensic pathology, 71
Avulsions, examination of, 343
Axonal injury, diffuse, in head trauma, 50–54
Azathioprine, in transplantation, toxicology of, 756–757

Basilar fractures, of skull, 41
Beirut, retaliation murders in, 111–112
Benign fibrous histiocytoma, fine needle aspiration of, 516
Benzodiazepines, testing for, in psychiatric outpatient service, 718
Benzoyl ecgonine testing, in urine, gas chromatography-mass spectrometry in, **699–704**
in psychiatric outpatient service, 719
Biliary tract, obstruction of, copper metabolic defects in, 676
papillary neoplasms of, fine needle aspiration of, 385
Biopsy, fine needle aspiration in. See *Fine needle aspiration.*
Blast injuries. See *Bombings.*
Blast lung, in bombing, 100
Blind deconvolution, in image processing, 174–176
Blunt injuries, patterns of, 339–344
autopsy in, 343–344
classification of, 340–343
Body packing, of contraband materials, forensic radiology in, 233
Bombings, in terrorism, 100–108
air-blast injuries in, 100
airplane (TWA Flight 840), 103–108
car (Rhein Main Air Force Base, 8/8/85), 102
fragment injuries in, 101
hand examination in, 101–102
injuries while standing on solid surface, 101
nightclub (La Belle Disco, 4/86), 108
primary effects of, 101
secondary effects of, 101
water-blast injuries in, 100
Brain, abscess of, in head trauma, 58–59
cold exposure effects on, 86
hypoxia of, in head trauma, 55
in neck compression, 12
lesions of, in pediatric patients, sudden death in, 328–329
swelling of, in head trauma, 56
trauma to. See *Head trauma.*
Brain stem, injury of, 54
Breast, fine needle aspiration of, carcinoma, 369, 371
medicolegal issues in, **599–605**
papillary neoplasms, 374–377
Brequinar, in transplantation, toxicology of, 761
4-Bromo-2,5-dimethoxyamphetamine, as recreational drug, 743
Bronchogenic adenocarcinoma, fine needle aspiration of, 383–384
Bronchopneumonia, in pediatric patients, sudden death in, 331–332
Bronchopulmonary dysplasia, sudden death in, 327
Bruises, examination of, 341–342
Brush (scrape) abrasions, examination of, 340–341
Bullet identification information systems, 68–71
Bullet wounds. See also *Rifle wounds.*
radiology of, 197, 231–232
BULLETPROOF firearms identification system, 69
Burkitt lymphoma, fine needle aspiration of, 554–555
Burns, in bombings, 101

Calcification, arterial, in infants, sudden death in, 326
Cannabis, testing for, in psychiatric outpatient service, 718
Capsaicin spray, death from, 19–20
Car bombing, 102
Carbonic anhydrase, zinc and, 677
Carcinogenic potential, of diesel exhaust, 767, 769–773
Carcinoid tumor, kidney, fine needle aspiration of, 443–444
Carcinoma, fine needle aspiration of, adenosquamous, 414
adrenal gland, 451–452
anaplastic, kidney, 443–444, 448
thyroid gland, 474–475
breast, 369, 371

Carcinoma *(Continued)*
medicolegal issues in, **599–605**
clear cell, hepatocellular, 496
kidney, 385–386
collecting duct, 386–387, 441
embryonal, mediastinum, 384
follicular, thyroid gland, 468–470
hepatocellular, 368
clear cell, 496
fibrolamellar, 496
poorly differentiated, 487–495
well-differentiated, 487–493
intracystic papillary, 375–376
kidney, 443–444, 448
clear cell, 385–386
collecting duct, 386–387, 441
renal cell, 436–442
squamous cell, 448
medullary, 474
metastatic, liver, 493–499
pancreas, 414
papillary, thyroid gland, 471–473
renal cell, 436–442
salivary glands, 382–383
small cell, 365
small cell anaplastic, kidney, 443–444, 448
squamous cell, 364
kidney, 448
thyroid gland, follicular, 468–470
medullary, 474
papillary, 471–473
transitional cell, kidney, 387, 447
Cardiomyopathy, in pediatric patients, sudden death in, 326–327
Cardiovascular disorders, in pediatric patients, sudden death in, 325–327
Cardiovascular function, in cold exposure, 86–87
Carotid arteries, compression of, in restraint, 9–10
Carotid sinus stimulation, in neck hold, death in, 12–13
Catatonia, lethal, in restraint, 16
Catecholamine rush, in restraint, death in, 15–16
Census of Fatal Occupational Injuries, 33
Centerfire rifle wounds. See *Rifle wounds.*
Central nervous system. See also *Brain.*
lesions of, in pediatric patients, sudden death in, 328–329
papillary neoplasms of, fine needle aspiration of, 389
Centrifugation, in immunocytochemical specimen processing, 563–564
Cerebrospinal fluid analysis, in aluminum-induced neurofibrillary degeneration, 694–695
Ceruloplasmin, copper and, 676
Cervicothoracic junction, radiology of, in forensic pathology, 220
Channels, in image processing, 158, 160
Chemical ionization, in gas chromatography-mass spectrometry, in urine drug testing, 642–645
Chest, forensic pathology of, in rifle wounds, 193, 197
radiology in, 220
Child abuse, forensic radiology in, 225–229
Children. See *Pediatric patients.*
Choke hold, in restraint, 9
Cholangiocarcinoma, fine needle aspiration of, 499–503
Chop wounds, examination of, 348
Chromophobe renal cell carcinoma, fine needle aspiration of, 439, 441
Circumstantial evidence, in postmortem identification, 119
Cirrhosis, mineral-associated, in infants, **665–671**
Civil litigation, forensic pathology in, in asbestos-related disease, 254–258
in coal workers' pneumoconiosis, 258–259
radiology in, 234–235
Clear cell hepatocellular carcinoma, fine needle aspiration of, 496
Clear cell sarcoma, fine needle aspiration of, 444–445, 533
Clothing, for postmortem identification, 116–117
Clothing insulation units, calculation of, for cold environment, 85
Clots, in pulmonary arteries, forensic pathology in, 242
Coal workers' pneumoconiosis, forensic pathology in, 258–259
Coast Guard, drug testing program of, 786–787
Cocaine use, death from, in custody, 16–18
forensic pathology in, 248–250
gas chromatography-mass spectrometry in, 640, **699–704**
testing for, in psychiatric outpatient service, 718–719
Codeine, testing for, in psychiatric outpatient service, 717–718
Cold-related injuries, 84–88
cold stress, 84–85
death in, 87–88
illnesses, 85–87
Collaboratory, in forensic pathology, 75
Collecting duct carcinoma, fine needle aspiration of, 386–387, 441
Colloid goiter, fine needle aspiration of, 467–468
Colon, Hirschsprung's disease of, sudden death in, 329

Color image processing, in forensic pathology, 171–172
Combined DNA Index System, in forensic pathology, 73
Comminuted fractures, of skull, 40–41
Communication, electronic. See *Internet use.*
Compound fractures, of skull, 40
Compressive strain, skull fracture in, 40
Computed tomography, in fine needle aspiration, liver, 484
pancreas, 402
in forensic radiology, 235–236
Computer-Assisted Postmortem Identification software, for dental records, 122
Computers, in forensic pathology. See also *Image processing.*
dental record comparisions, 122
DNA data base, 71–73
firearms identification systems, 68–71
graphics techniques in, 73–74
in postmortem identification, 118, 122
informatics, 74–75
Conduction, in heat transfer, 78–79
Confirmation, in urine drug testing, 633–634
in drug testing programs, 793
in psychiatric outpatient service, 720
Congenital disorders, in autopsy, 324
Contrast enhancement, in image processing, 166–172
Contrecoup contusions, of brain, 43–45
Contrecoup fractures, of skull, 41
Contusions, examination of, 340–342
of brain, 42–47, 54
in child abuse, 59
Convection, in heat transfer, 79
Copper, cirrhosis associated with, in infants, **665–671**
in nutrition, 674–677
Coronary artery anomalies, in pediatric patients, sudden death in, 326
Coroner systems, body transport in, 304
conflicts with medical examiner systems, 284–285
demographics of, 283, 290–291
facilities for, 310–311
future trends in, 316–318
historical review of, 281–283
lay persons in. See *Lay death investigators.*
role of, 279–280
scene investigations by, 302, 304
staffing of, 302
Coroners, litigation against. See *Litigation, against medical examiners.*
Corpus callosum injury, 51
Corticosteroids, in transplantation, toxicology of, 757–758
Coup contusions, of brain, 43–44
Courtroom illustrations, image processing for, 154
Crack cocaine use, forensic pathology in, 248–250
Cramps, heat, 82
Crime, pathology studies in. See *Forensic pathology.*
recreational drug use in. See *Recreational drugs.*
Criminal litigation, forensic radiology in, 232–234
Cryptococcosis, adrenal gland, fine needle aspiration of, 457
Custody, death in. See *Death, in custody.*
Cyclophosphamide, in transplantation, toxicology of, 758
Cyclosporine, in transplantation, toxicology of, 758–759
Cyst(s), fine needle aspiration of, adrenal gland, 456
ganglion, 537
kidney, 431–432
pancreatic, 416–423
parathyroid glands, 465
thyroglossal duct, 381, 464
thyroid gland, 464–465
Cystadenoma, serous, fine needle aspiration of, 417
Cytochrome oxidases, copper and, 674
Cytopathology, electronic imaging in, **585–598**
computers for, 592
file storage in, 596
hardware for, 586–587
image capture in, 587–588
image editing in, 594–596
input devices for, 588
output devices for, 589–592
scanners for, 588–589
software for, 593–594
fine needle aspiration for. See *Fine needle aspiration.*
new techniques for, **561–587**
immunocytochemistry, 358–361, 562–565
in situ hybridization, 565–573
in situ polymerase chain reaction, 571–573
microdissection with polymerase chain reaction, 573–579

Date-rape drugs. See *Recreational drugs.*
Daubert ruling, for evidence, 263
de Quervain's thyroiditis, fine needle aspiration of, 465–466
Death, forensic radiology in. See *Radiology, forensic.*

Death *(Continued)*
from pulmonary disease. See *Pulmonary disease, forensic pathology in.*
identity determination after. See *Identity determination.*
in cold exposure, 87–88
in custody, **1–22**
autopsy in, 2–3
certification of, 18–19
circumstances of, 2
community concern about, 1
epidemiology of, 4
from pepper spray, 19–20
in institutions, 3–9
in physical restraint, 9–19
information release in, 8
natural causes of, 3, 6
on street, 8–9
resuscitation injuries in, 4–5
scene information in, 2
toxicologic studies in, 3
in heat exposure, 83–84
investigative systems for, **279–322**
autopsy personnel requirements of, 303
current state of, 283
facilities for, 310, 316
forensic pathologist in, 280–281, 304, 308–310
future trends in, 316–318
historical review of, 281–283
lay persons in. See *Lay death investigators.*
obstacles to, 284–285
standard operating procedures of, 281
tasklist for, 287
severe hypothermia simulating, 87
sudden, in pediatric patients. See *Sudden death, in pediatric patients.*
Death certificates, for death in custody, 18–19
in epidemiologic research, 25
person identification for, 115
Deblurring, in image processing, 172, 174–176
Deconvolution, in image processing, 174–176
Defense wounds, 343
Dehydration, in pediatric patients, sudden death in, 329–330
Delirium, excited, death in, 16–17
Dementia, neurodegenerative, animal models of. See *Aluminum encephalomyelopathy, experimental.*
Dental comparisons, computer graphics programs for, 74
in postmortem identification, 120–122
Dentures, in postmortem identification, 117–118
15-Deoxyspergualin, in transplantation, toxicology of, 763
Depressed fractures, of skull, 40
Dermatofibrosarcoma protuberans, fine needle aspiration of, 517
Designer drugs, amphetamine analogues as, 737–744
Diarrhea, in pediatric patients, sudden death in, 329–330
Diastatic fractures, of skull, 41
Diazepam, testing for, in psychiatric outpatient service, 718
Diesel exhaust, **767–779**
carcinogenic potential of, 767, 769–773
composition of, 768–769
exposure to, criteria for, 767
monitoring of, 774–775
in general air pollution, 768
toxicity of, animal studies of, 769–770
biological monitoring of, 775–777
epidemiology of, 770–772
from particulates, 769–770, 772–775
in vitro studies of, 769
noncancer effects, 773–774
risk assessment for, 772–773
Diffuse axonal injury, in head trauma, 50–54
Diffuse vascular injury, in head trauma, 55
Digital image processing. See *Image processing.*
Disasters, mass casualties and fatalities in, postmortem identification in, 132–134
radiologic identification in, 221–222
Diverticulum, Meckel's, in pediatric patients, sudden death in, 329
DNA adducts, of diesel exhaust, measurement of, 776–777
DNA technology, in forensic pathology, data base for, 71–73
in postmortem identification, 127–131
in mass fatalities, 133
Documents, on body, in postmortem identification, 116
Domestic violence, injury in, forensic radiology in, 225–230
Dopamine-β-hydroxylase, copper and, 675
Driving under the influence of drug cases, forensic toxicology in, 268–269
Drug(s), death from, in restraint, 17–18
lethal levels of, forensic pathology information on, 29–30
smuggling of, forensic radiology in, 233
Drug abuse, forensic pathology in. See also *Drug testing programs; Toxicology, forensic.*
drug testing programs in, **781–803**
for Employee Assistance Program, **747–753**

gas chromatography-mass spectrometry in. See *Gas chromatography-mass spectrometry.*
in psychiatric outpatient service, **713–726**
intrapulmonary particulates in, 251–252
intravenous, intrapulmonary particulates in, 251–252
liquid chromatography-mass spectrometry in. See *Liquid chromatography-mass spectrometry.*
recreational drugs, **727–746**
urine testing in. See *Urine testing, for drugs.*
Drug Abuse Warning Network, reporting to, 32
Drug testing programs, **781–803**
collection process in, 791–792
federal employee testing directives, 783–787
medical records maintenance in, 802
medical review officer in, 782, 789–790
process of, 785, 788–789
proficiency testing program in, 802–803
randomization in, 802
reporting in, 801–802
results interpretation in, 794–796
re-test in, 798–800
return to duty determination in, 800–801
testee contact in, 797–798
testing process in, 792–794
types of, 782
unregulated, 788
DRUGFIRE firearms identification system, 69–71
Ductal adenocarcinoma, fine needle aspiration of, 407–409
DUID (driving under the influence of drug) cases, forensic toxicology in, 268–269
Duret hemorrhage, in head trauma, 54

Echinococcosis, adrenal gland, fine needle aspiration of, 457
Ecstasy (3,4-methylenedioxy-methamphetamine, MDMA), 730, 737–739
Edema, cerebral, in head trauma, 56
Education, for forensic radiology, 235
Egypt Air Flight 848 hijacking, murders in, 110
Elastofibroma, fine needle aspiration of, 537
Elder abuse, forensic radiology in, 230
Electron ionization, in gas chromatography-mass spectrometry, in urine drug testing, 639–641
Electronic imaging, in cytopathology. See *Cytopathology.*
E-mail, in forensic pathology, 92–93
Embolism, fat, in head trauma, 57
forensic pathology in, air, 247–348
amniotic fluid, 246–247
pulmonary artery, 242, 246–248
Embryonal carcinoma, mediastinal, fine needle aspiration of, 384
Employee Assistance Program, **747–753**
aftercare in, 751–752
assessment in, 751
early detection in, 748–751
integration of services in, 752
prevention strategies of, 747–748
referral in, 751
Empyema, subdural, in head trauma, 57
Endocardial fibroelastosis, in pediatric patients, sudden death in, 327
Endocrine tumors, pancreatic, fine needle aspiration of, 414, 416, 421
Environmental pathology, forensic pathologist participation in, 31
Enzyme immunoassays, for forensic toxicology, 271–272
Epidemiologic research, forensic pathology in, **23–37**
contributions by, 29–32
current trends in, 23–25
death certificates for, 25
examples of, 26–29
funding of, 35
future suggestions for, 34–35
literature concerning, 29
problems in, 33–34
risks of, 35
surveillance system reports in, 32–33
Epidural hemorrhage, in head trauma, 41–42
Epiglottitis, sudden death in, 332
Epilepsy, in pediatric patients, sudden death in, 328–329
Epithelioid sarcoma, fine needle aspiration of, 532–533
Estrogen receptors, immunoperoxidase technique for, 361
Ethnicity, determination of, from dental examination, 121
from hair characteristics, 127
from skeletal examination, 125
Evaporation, in heat transfer, 79–80
EVE (3,4-methylenedioxyethyl-amphetamine, MDEA), 730, 741–742
Excess mortality, in heat-related epidemics, 27, 83–84
Excited delirium, death in, 16–17
Exercise, heat stroke in, 82–83
Exhaust, diesel. See *Diesel exhaust.*
Exhaustion, heat, 82

Experimental aluminum encephalomyelopathy. See *Aluminum encephalomyelopathy, experimental.*
Explosions, in terrorism. See *Bombings.*

Face, aging of, computer graphics in, 74
injury of, forensic radiology in, 227
reconstruction of, computer graphics in, 74
in postmortem identification, 124–126
False-negative and false-positive results, in breast carcinoma fine needle aspiration, 602–603
Fasciitis, fine needle aspiration of, nodular, 535–536
proliferative, 536
Fat embolism, in head trauma, 57
Fatal Accident Reporting System, 33
Fatty tissue tumors, fine needle aspiration of, 508–513
Federal employees, drug testing directives for, 783–787
Fibrolamellar hepatocellular carcinoma, fine needle aspiration of, 496
Fibroma, of heart, in pediatric patients, sudden death in, 326
Fibromatosis, fine needle aspiration of, 513–514
Fibrosarcoma, fine needle aspiration of, 514–516
Fibrous histiocytoma, fine needle aspiration of, benign, 516
malignant, 517
File Transfer Protocol, for document transfer, 96–97
Fine needle aspiration, cytology pattern approach to, **357–372**
in breast carcinoma, 369, 371
morphologic features and, 364–369
principles of, 362–364
specimen collection in, 358–362
electronic imaging and, **585–598**
new cytopathologic techniques and, **561–583**
of adenocarcinoma. See *Adenocarcinoma.*
of adipose tissue tumors, 508–513
of adrenal gland, **448–457**
of biliary tree, papillary neoplasms, 385
of bone, papillary neoplasms, 391–392
of breast, carcinoma, 369, 371
medicolegal issues in, **599–605**
papillary neoplasms, 374–377
of carcinoma. See *Carcinoma.*
of central nervous system, papillary neoplasms, 389
of cysts. See *Cyst(s).*
of fibrous lesions, 513–516
of hepatocellular carcinoma. See *Hepatocellular carcinoma.*
of Hodgkin's lymphoma, 367, 545–547
of kidney, 385–387, **429–448**
of liver. See *Liver.*
of lung, adenocarcinoma, 367–368
papillary neoplasms, 383–384, 392–393
of lymph nodes, 390–391, 543–545
of lymphoma. See *Lymphoma.*
of malignant melanoma, 366
of mediastinum, papillary neoplasms, 384, 392–393
of metastasis. See *Metastasis.*
of muscle tumors, 525–528
of neural tumors, 518–523
of ovary, papillary neoplasms, 388–389
of pancreas, 385, **401–427**
of papillary neoplasms. See *Papillary neoplasms.*
of parathyroid glands, 382, 465
of salivary glands, 382–383
of sarcoma. See *Sarcoma.*
of skin, 394
of smooth muscle tumors, 528–530
of soft-tissue lesions, 394, **507–540**
of tenosynovial lesions, 524–525
of testis, papillary neoplasms, 388
of thyroid gland, 377–382, **461–482**
of vascular lesions, 530–532
Fingerprints, automated identification system for, 66–68, 120
in postmortem identification, 119–120
Firearm wounds. See also *Rifle wounds.*
radiology of, 197, 231–232
Firearms identification information systems, 68–71
Fixation, of immunocytochemical specimens, 564–565
FK 506 (tacrolimus), in transplantation, toxicology of, 759–761
Flame atomic emission spectrometry, in trace element analysis, 618–619
Flow cytometry, specimen collection for, 361–362
Flunitrazepam, 730, 732–737
Fluorescence in situ hybridization, in cytopathology, 565–571
technique for, 568–571
uses of, 565–566, 568
Follicular center fragments, in lymph node, 544–545
Follicular center lymphoma, fine needle aspiration of, 550–551
Food and Drug Administration, medical products reporting system, reporting to, 32–33
Footprints, in postmortem identification, 120
Foreign bodies, radiology of, in forensic pathology, 225

Forensic pathology, epidemiologic aspects of, **23–37**
image processing in, **151–181**
in pulmonary disease, **241–262**
in sudden natural death, in pediatric patients, 252–254, **323–338**
injury patterns in, **339–350**
Internet information on, **91–97**
litigation related to, **139–150**
medicolegal death investigative systems in, **279–322**
of death in custody, **1–22**
of head trauma, **39–64**
of postmortem identification, **115–137**
of rifle wounds, **189–201**
of terrorism, **99–114**
of thermal injuries, **77–90**
radiology in, **203–240**
in injury, 343–344
technology for, **65–76**
toxicology in. See *Toxicology, forensic.*
web sites for, 95–96
Fracture(s), in blast injuries, while standing on solid surface, 101
in rifle wounds, from temporary cavity, 191
radiology of, in abuse, 225–231
in injury evaluation, 223–225
skull, 40–41
in child abuse, 59
Fracture contusions, of brain, 45–46
Fragment injuries, in bombings, 101
Fuhrman's nuclear grading system, for renal cell carcinoma, 437
Full scan analysis, in gas chromatography-mass spectrometry, in urine drug testing, 639

Gamma-hydroxybutyrate, as recreational drug, 728–732
Ganglion cyst, fine needle aspiration of, 537
Ganglioneuroblastoma, adrenal gland, fine needle aspiration of, 455
Ganglioneuroma, adrenal gland, fine needle aspiration of, 455
Gas chromatography, in drug detection, amphetamine analogues, 744
gamma-hydroxybutyrate, 732
Gas chromatography-mass spectrometry, in drug detection, amphetamine analogues, 744
in forensic toxicology, 272–275
in drug testing programs, 792–793
in urine drug testing, **631–649**
advantages of, 634
chemical ionization in, 642–645
difficulties with, 635
electron ionization in, 639–641
flexibility of, 634
for cocaine metabolites, **699–704**
full scan analysis in, 639
ion motion theory and, 636–639
ion trap detector in, 645–646
legal aspects of, 634
mass spectrometer component of, 636, 646–648
misconceptions about, 633–634
procedure selection in, 632, 635
professional practice standards in, 633–634
selected ion monitoring in, 641–642
solids probe in, 645
tandem mass spectrometry in, 646–648
Gastrointestinal disorders, in pediatric patients, sudden death in, 329–330
Gender assignment, in forensic radiology, 210–211
Gender determination, in anthropology, 124–125
Germ cell tumors, mediastinal, fine needle aspiration of, 384
Giant cell tumors, tendon sheath, fine needle aspiration of, 524
Gliding contusions, of brain, 54
Glutaraldehyde, as adulterant, in urine drug testing, 272
Glutathione peroxidase, selenium and, 680
Goblet cells, of pancreas, fine needle aspiration of, 404, 406
Goiter, fine needle aspiration of, cystic nodular, 464
nodular (adenomatoid, colloid), 467–468
Granular cell tumor, fine needle aspiration of, 520–521
Granulomatous thyroiditis, fine needle aspiration of, 465–466
Graphics, computer, for forensic pathology, 73–74. See also *Image processing.*
Great vessel disorders, sudden death in, 325–327
Greyscale images, 158
Growing fractures, of skull, 40
Gun identification information systems, 68–71
Gunshot wounds. See also *Rifle wounds.*
radiology in, 197, 231–232

Hair, characteristics of, in postmortem identification, 126–127
in drug testing, for psychiatric outpatient service, 716
Hallucinogens. See *Recreational drugs.*

Hand, examination of, in blast injury, 101–102
Hanging, investigation of, 5–8
Hantavirus pulmonary syndrome, epidemiologic investigation of, 26
Hashimoto's thyroiditis, fine needle aspiration of, 466–467
Head trauma, **39–64**
  brain swelling in, 56
  classification of, 39–40
  contusions in, 42–47
  diffuse axonal injury in, 50–54
  diffuse vascular injury in, 55
  epidural hemorrhage in, 41–42
  fat embolism in, 57
  hypoxia in, 55
  in pediatric patients, contusions in, 47
    in child abuse, 58–59
  in rifle wounds, 192–195, 200
    in suicide, 199
  infection after, 57–58
  intracerebral hemorrhage in, 47
  intracranial pressure increase in, 56–57
  ischemia in, 55
  lacerations in, 42–43
  pontomedullary avulsion in, 47
  primary impact, 40–47
  primary inertial, 47–55
  secondary, 55–58
  skull fracture in, 40–41
  subarachnoid hemorrhage in, 42
  subdural hematoma in, 47–50, 59
Heart disorders, in pediatric patients, sudden death in, 325–327
Heat balance analysis, in cold environment, 85
Heat gain, thermoregulation and, 78–80
Heat loss, thermoregulation and, 78–80
Heat-related injuries, 81–84
  death in, 83–84
    epidemiologic investigation of, 27, 83–84
  heat cramps, 82
  heat exhaustion, 82
  heat stress, 81–82
  heat stroke, 82–83
Hemangioma, fine needle aspiration of, 530–531
Hematoma, examination of, 340–341
  subdural, in trauma, 47–50, 59
Hemochromatosis, perinatal, 666–668
Hemorrhage, brain, in pediatric patients, sudden death in, 328
  in head trauma, dating of, 46, 49
    Duret, 54
    epidural, 41–42
    in diffuse axonal injury, 51–52, 54
    in shaken baby syndrome, 58–59
    intracerebral, 47
    retinal, in shaken baby syndrome, 58
    subarachnoid, 42
    subdural, 47–50
Hemosiderosis, in pediatric patients, sudden death in, 327
Hepatocellular carcinoma, fine needle aspiration of, 368, 487–493
    clear cell, 496
    fibrolamellar, 496
    poorly differentiated, 494
    versus metastatic carcinoma, 493–499
Herniation contusions, of brain, 46
Heroin, testing for, in psychiatric outpatient service, 717–718
Hibernoma, fine needle aspiration of, 512–513
High pressure liquid chromatography, in drug detection, amphetamine analogues, 744
    flunitrazepam, 737
    gamma-hydroxybutyrate, 732
Hijacking, murders during, 109–110
Hirschsprung's disease, sudden death in, 329
Histiocytoma, fibrous, fine needle aspiration of, benign, 516
    malignant, 517
Histogram(s), in image processing, 160, 162
Histogram equalization, in image processing, 169
Histogram stretch, in image processing, 167, 169
Histoplasmosis, adrenal gland, fine needle aspiration of, 457
Hodgkin's lymphoma, fine needle aspiration of, 367, 545–547
Home pages, for forensic pathology, 95–96
Hot weather. See *Heat-related injuries.*
Human immunodeficiency virus infection, testing for, in forensic pathology, 31–32
Human rights abuse, forensic radiology in, 230–231
Humidity, heat transfer and, 79–80
Hunting rifle wounds. See *Rifle wounds.*
Hurthle-cell tumors, fine needle aspiration of, 381–382, 470–471
m-Hydroxybenzoyl ecgonine testing, in urine, gas chromatography-mass spectrometry in, **699–704**
Hydroxyethylvaline-hemoglobin adducts, measurement of, in diesel exhaust studies, 777
1-Hydroxypyrene, as diesel exhaust marker, 776–777
Hyperkalemia, from cyclosporine, 759
Hypertension, pulmonary, in pregnancy, forensic pathology in, 245–246

Hypertext Mark Up Language, for Internet, 92
Hyperthermia, in heat stroke, 82–83
Hypothalamus, in thermoregulation, 80
Hypothermia, in cold exposure, 85–87
death from, 87–88
Hypoxia, brain, in head trauma, 55
in neck compression, 12

Identification, of remains. See *Postmortem identification.*
Identity determination, radiology in, 208–222
anthropologic parameters in, 208–215
in mass casualty situations, 221–222
of individual remains, 216–218
tissues used in, 218–221
Image processing, in forensic pathology, **151–181**
animations in, 177–178
applications of, 154–158
cleaning up image in, 163–166
concepts of, 158–162
contrast enhancement in, 166–172
deblurring in, 172, 174–176
description of, 151–152
feature emphasis in, 153–154
in archiving, 157–158
in courtroom illustration, 154
in interrogation illustrations, 154, 156
measurements in, 176
pitfalls of, 178–180
three-dimensional visualization in, 176–177
Immunoassays, for forensic toxicology, 271–272
amphetamine analogues, 743–744
flunitrazepam, 735–737
in drug testing programs, 792–793
in psychiatric outpatient service, 714–715
Immunocytochemistry, 562–565
fixation in, 564–565
specimen collection for, 358–361
specimen processing for, 563–564
troubleshooting in, 565–566
Immunoperoxidase studies, specimen collection for, 359–360
Immunosuppressive drugs, in transplantation, toxicology of, **755–765**
azathioprine, 756–757
corticosteroids, 757–758
cyclosporine, 758–759
15-deoxyspergualin, 763
lefluomide, 764
mizoribine, 763
mycophenolate mofetil, 762–763
rapamycin, 761–762
sodium brequinar, 761
tacrolimus (FK 506), 759–761
Impact abrasions, examination of, 341
In situ hybridization, in cytopathology, 565–573
In situ polymerase chain reaction, in cytopathology, 572–573
Incised wounds, examination of, 347–348
Indian childhood cirrhosis, 668–670
Individual remains, identification of, radiology in, 216–218
Inductively coupled plasma-mass spectrometry, in trace element analysis, 620-626
interferences in, 624–626
mass spectrometer in, 621
plasma unit in, 621
sample introduction system in, 621
sample treatment in, 621, 624
versus other technologies, 620
Infants. See *Pediatric patients.*
Infections, in head trauma, 57–58
in pediatric patients, sudden death in, 331–333
Informatics, for forensic pathology, 74–75
Internet in, 74–75, **91–97**
Information systems, for data transfer, 74–75
for DNA data base, 71–73
for firearms identification, 68–71
for imaging archiving, 157–158
Informed consent, for breast fine needle aspiration, 600–601
Inhalation, of particulates, forensic pathology in, 250–251
Injuries. See also *Abuse.*
evaluation of, radiology in, 222–225
forensic pathology studies in, for treatment, 30
gunshot. See also *Rifle wounds.*
radiology in, 197, 231–232
head. See *Head trauma.*
patterns of, **339–350**
blunt, 339–344
autopsy in, 343–344
classification of, 340–343
sharp, 344–349
autopsy in, 348–349
chop, 348
incised, 347–348
stab, 345–347
Institutions, death in. See *Death, in custody.*
Instrument control tool, in forensic pathology, 75
Instrumental neutron activation analysis, of trace elements, 619–620
Instrumentation. See *Technology.*

Integrated automated fingerprint identification system, 66–68, 120
Intermediary targets, in rifle wounds, 198–199
Internet use, in forensic pathology, 74–75, **91–97**
  connecting software, 92
  e-mail, 92–93
  file transfer, 96–97
  literature searching, 95
  news-groups, 93–94
  web sites, 95–96
Interstitial pneumonitis, in pediatric patients, sudden death in, 332
Interviewing, illustrations for, image processing for, 154, 156
Intestinal obstruction, in pediatric patients, sudden death in, 329
Intracerebral hemorrhage, in trauma, 47
Intracranial pressure, increase of, in head trauma, 56–57
Intracystic papillary carcinoma, fine needle aspiration of, 375–376
Intraductal papilloma, fine needle aspiration of, 375–376
Intussusception, in pediatric patients, sudden death in, 329
Investigative systems, for death. See *Death, investigative systems for.*
Iodothyronine deiodinase, selenium and, 680
Ion monitoring, selected, gas chromatography-mass spectrometry, in urine drug testing, 641–642
Ion motion theory, gas chromatography-mass spectrometry and, 636–639
Ion trap detector, in gas chromatography-mass spectrometry, in urine drug testing, 645–646
Ionization, in gas chromatography-mass spectrometry, in urine drug testing, chemical, 642–645
  electron, 639–641
Iron, cirrhosis associated with, in infants, **665–671**
Ischemia, brain, in head trauma, 55

Jail, death in. See *Death, in custody.*
Juxtaglomerular cell tumor, fine needle aspiration of, 435

Kai's Soap software, 593
Kaposi's sarcoma, fine needle aspiration of, 531–532
Kashin-Beck disease, 680
Kawasaki disease, sudden death in, 326
Keshan disease, 680
Kidney, fine needle aspiration of, **429–448**
  abscess, 434–435
  adenocarcinoma, 448
  allograft rejection, 446–447
  angiomyolipoma, 432–433
  carcinoid tumor, 443–444
  clear cell sarcoma, 444–445
  complications of, 430–431
  contraindications for, 430
  cyst, 431–432
  cytodiagnostic accuracy of, 431
  indications for, 429–430
  juxtaglomerular cell tumor, 435
  leiomyosarcoma, 444
  lymphoma, 444
  metastasis, 445
  multicystic nephroma, 435
  normal cytology in, 431
  oncocytoma, 434
  papillary neoplasms, 385–387, 438–439
  pelvis, 431, 447–448
  renal cell carcinoma, 436–442
  rhabdoid tumor, 445
  small cell anaplastic carcinoma, 443–444, 448
  squamous cell carcinoma, 448
  techniques for, 430
  transitional cell carcinoma, 447
  Wilms' tumor, 442–443
  xanthogranulomatous pyelonephritis, 434–435
Klear, as adulterant, in urine drug testing, 272–273
Knife wounds, 345–347

Lacerations, brain, 42–43
  examination of, 342–343
Large cell lymphomas, fine needle aspiration of, 555–558
Larynx, examination of, in neck compression, 10–11
Latent fingerprint services, 67
Law enforcement, pathology studies in. See *Forensic pathology.*
Lay death investigators, attributes of, 285–289
  demographics of, 290–291
  hiring of, 288–289, 292, 302
  historical review of, 281–283
  importance of, 280
  nurses as, 286
  salaries of, 289–291, 293–301
  scene investigations by, 302, 304
  staffing patterns in, 302
  training of, 286

Le Belle Disco bombing, 108
Lead snowstorm, in gunshot wounds, 197, 232
Leflunomide, in transplantation, toxicology of, 764
Legal issues. See also *Litigation.*
in breast carcinoma fine needle aspiration, **599–605**
in forensic pathology. See *Death, investigative systems for; Lay death investigators.*
in medical examiner suits. See *Litigation, against medical examiners.*
Legislation, on employee drug testing, 783–787
Leiomyoma, fine needle aspiration of, 528
Leiomyosarcoma, fine needle aspiration of, 444, 528–530
Lethal catatonia, in restraint, 16
Lighting correction, in image processing, 163–165
Linear fractures, of skull, 40
Lipoblasts, in liposarcoma, 509–512
Lipoma, fine needle aspiration of, 508–509
Liposarcoma, fine needle aspiration of, 509–513
Liquid chromatography, in drug detection, amphetamine analogues, 744
flunitrazepam, 737
gamma-hydroxybutyrate, 732
Liquid chromatography/mass spectrometry, with particle beam interface, in forensic toxicology, **651–663**
chromatographic system in, 652–653
data analysis in, 653, 655
extraction procedure in, 653–654
reagents for, 652
results of, 655–662
standards for, 652
technical aspects of, 651–652
Literature searching, on Internet, 95
Litigation, against medical examiners, sovereign immunity defense in, **139–150**
in negligence, 142–144
in unauthorized autopsy, 144–147
in unauthorized organ harvesting, 148–149
public official status in, 140–142
Supreme Court ruling on, 140
civil, forensic pathology in, in asbestos-related disease, 234–235
in coal workers' pneumoconiosis, 258–259
radiology in, 234–235
criminal, forensic radiology in, 232–234
Liver, fine needle aspiration of, **483–506**
adenocarcinoma, 499–503
cholangiocarcinoma, 499–503
complications of, 484
contraindications for, 483
hepatocellular carcinoma, 368, 487–493
versus metastatic carcinoma, 493–499
metastasis, 500–503
versus hepatocellular carcinoma, 493–499
normal cytology, 486–487
papillary neoplasms, 385, 393
preparation for, 483–484
techniques for, 484–486
mineral-associated cirrhosis of, in infants, **665–671**
Lividity, in cold-related death, 88
Loss of heterozygosity, comparison of, 574–579
Love drug (3,4-methylenedioxyamphetamine, MDA), 730, 740–741
Lung, blast injury of, in bombing, 100
cancer of, from diesel exhaust, 767, 769–773
disease of. See *Pulmonary disease.*
examination of, in head trauma, 55
fine needle aspiration of, adenocarcinoma, 368–369
papillary neoplasms, 383–384, 392–393
Lymph nodes, fine needle aspiration of, hyperplasia versus malignancy in, 543–545
papillary neoplasm metastasis, 390–391
Lymphangiectasis, pulmonary, in pediatric patients, sudden death in, 328
Lymphoblastic lymphoma, fine needle aspiration of, 553–554
Lymphoglandular bodies, 542–543
Lymphoma, fine needle aspiration of, 366–367, **541–559**
B-cell extranodal marginal zone, 552
classification of, 547–548
follicular center, 550–551
Hodgkin's, 367, 545–547
kidney, 444
large cell, 555–556
anaplastic, 556–558
lymphoblastic, 553–554
lymphoid versus nonlymphoid, 542–543
lymphoplasmacytic, 550
mantle cell, 551–552
mixed small and large cell, 558
small cell, lymphocytic, 548–549
small noncleaved cell (Burkitt), 554–555
thyroid gland, 475–476
versus lymphoid hyperplasia, 543–545
Lymphoplasmacytic lymphoma, fine needle aspiration of, 550

Lysyl oxidase, copper and, 675

Macrophages, tingible-body, in lymph node, 544
Malignant edema/hyperemia, in head trauma, 56
Malignant fibrous histiocytoma, fine needle aspiration of, 444, 517
Malignant melanoma, fine needle aspiration of, 366
Malignant peripheral nerve sheath tumors, fine needle aspiration of, 521–522
Malpractice, in breast carcinoma fine needle aspiration, **599–605**
Mandible, radiology of, in forensic pathology, 210
Mantle cell lymphoma, fine needle aspiration of, 551–552
Marijuana use, forensic toxicology in, driving and, 269
  testing for, in psychiatric outpatient service, 718
Mass casualties, radiologic identification in, 221–222
Mass fatalities, postmortem identification in, 132–134
Mass spectrometry, in forensic toxicology, 273–275
    gas chromatography with. See *Gas chromatography-mass spectrometry.*
    liquid chromatography with. See *Liquid chromatography-mass spectrometry.*
  inductively coupled plasma, in trace element analysis, 620–626
MDA (3,4-methylenedioxyamphetamine, love drug), 730, 740–741
MDEA (3,4-methylenedioxyethylamphetamine), 730, 741–742
MDMA (3,4-methylenedioxymethamphetamine, ecstasy), 730, 737–739
Meckel's diverticulum, in pediatric patients, sudden death in, 329
Mediastinum, fine needle aspiration of, papillary neoplasms, 384, 392–393
Medical examiner systems, body transport in, 304
  case acquisition and handling policies in, 304–310
  conflicts with coroner systems, 284–285
  demographics of, 293–301, 312–315
  equipment for, 316
  facilities for, 310–311
  future trends in, 316–318
  historical review of, 281–283
  lay death investigators in. See *Lay death investigators.*
  role of, 279–281
  salaries in, 312–315
  scene investigations by, 302, 304
  staffing of, 302
Medical examiners, litigation against. See *Litigation, against medical examiners.*
Medical Examiners and Coroners Alert Project, 32
Medical records, comparison of, in postmortem identification, 122
Medical Review Officer, in drug testing programs, 270, 782, 789–790
Medicolegal issues, in breast carcinoma fine needle aspiration, **599–605**
Medium chain acyl CoA dehydrogenase deficiency, sudden death in, 330
Medline literature searches, 95
Medullary carcinoma, fine needle aspiration of, 474
Melanoma, malignant, fine needle aspiration of, 444, 517
Meningitis, hemogenic, in subarachnoid hemorrhage, 42
  in head trauma, 57
  in pediatric patients, sudden death in, 332
Meningococcemia, in pediatric patients, sudden death in, 333
Menkes' disease, copper metabolic defects in, 675–676
6-Mercaptopurine, in transplantation, toxicology of, 756–757
Mesothelioma, malignant, forensic pathology in, 256–258
Metabolic disorders, in pediatric patients, sudden death in, 330–331
Metabolism, heat production in, 78
Metastasis, fine needle aspiration of, adrenal gland, 455–456
    kidney, 445
    liver, 500–503
    papillary neoplasms, 390–394
    thyroid gland, 476
Methadone, poisoning with, epidemiologic investigation of, forensic pathology in, 26
  testing for, in psychiatric outpatient service, 719–720
Methamphetamine, testing for, gas chromatography-mass spectrometry in, 643–644
    in psychiatric outpatient service, 719
Methyl-2,5-dimethoxyamphetamine, as recreational drug, 742
3,4-Methylenedioxyamphetamine (MDA, love drug), 730, 740–741
3,4-Methylenedioxyethylamphetamine (MDEA), 730, 741–742
3,4-Methylenedioxymethamphetamine (MDMA, ecstasy), 730, 737–739

3,4-Methylenedioxyphenyl-2-butanamine, as recreational drug, 743
Microdissection, polymerase chain reaction with, in cytopathology, 573–579
Military rifle wounds. See *Rifle wounds.*
Missile wounds, from rifles. See *Rifle wounds.*
radiology of, 197, 231–232
Missing persons registries, in postmortem identification, 130–131
Mitochondrial DNA testing, in postmortem identification, 130
Mizoribine, in transplantation, toxicology of, 763
Molybdenum, in nutrition, 681–682
Monodisperse aerosol generating interface, with liquid chromatography-mass spectrometry. See *Liquid chromatography-mass spectrometry.*
Morphine, testing for, in psychiatric outpatient service, 717–718
Mucinous cystic neoplasms, fine needle aspiration of, 417–420
Mucocutaneous lymph node syndrome (Kawasaki disease), sudden death in, 326
Mucosa-associated lymphoid tissue, lymphoma of, fine needle aspiration of, 552
Multiplexing, in DNA analysis, in forensic pathology, 72
Multiresolution, in image processing, 172
Murders, in terrorism. See *Terrorism.*
Mutagenic potential, of diesel exhaust, 767, 769–773
Mycophenolate mofetil, in transplantation, toxicology of, 762–763
Myelolipoma, adrenal gland, fine needle aspiration of, 449–450
Myocarditis, in pediatric patients, sudden death in, 332
Myxoid liposarcoma, fine needle aspiration of, 510, 512
Myxoma, fine needle aspiration of, 536–537

National Association of Medical Examiners, 282–283
Inspection and Accreditation Checklist of, for postmortem identification, 137
National Crime Information Center, in postmortem identification, 130
National Fingerprint File, 68
National Institute on Drug Abuse, forensic toxicology guidelines of, 264–267
National Traumatic Occupational Fatalities surveillance system, 33
Neck, examination of, in compression, 10–11
Neck holds, death in, 9–12
Needle aspiration, fine. See *Fine needle aspiration.*
Negligence, lawsuits for, 142–144
Neonatal iron storage disease, 666–668
Nephroblastoma (Wilms' tumor), fine needle aspiration of, 442–443
Nephroma, multicystic, fine needle aspiration of, 435
Neuroblastoma, adrenal gland, fine needle aspiration of, 454–455
Neurofibrillary degeneration, animal models of. See *Aluminum encephalomyelopathy, experimental.*
Neurofibroma, fine needle aspiration of, 518–520
Neurofibrosarcoma, fine needle aspiration of, 521–522
Neuropathology, traumatic. See *Head trauma.*
Neutron activation analysis, of trace elements, 619–620
News-groups, in forensic pathology, 93–94
NIH Image software, 593–594
Nitrogen dioxide, in diesel exhaust, 774
Nodular fasciitis, fine needle aspiration of, 535–536
Nodules, thyroid, fine needle aspiration of. See *Thyroid gland, fine needle aspiration of.*
Noise reduction, in image processing, 165–166
Nucleic acid replication, zinc in, 678
Nutrition, trace metals in, **673–685**
copper, 674–677
molybdenum, 681–682
selenium, 679–681
zinc, 677–679

Occipital horn syndrome, copper metabolic defects in, 676
Occupational injuries, from diesel exhaust. See *Diesel exhaust.*
reporting of, 33
Oleoresin capsicum spray, death from, 19–20
Omnibus Transportation Employee Testing Act, 785
Oncocytoma, fine needle aspiration of, adrenal gland, 456
kidney, 434
Opiates, testing for, in psychiatric outpatient service, 717–718
Organ harvesting, unauthorized, lawsuits for, 148–149

Ovary, papillary neoplasms of, fine needle aspiration of, 388–389
Oxazepam, testing for, in psychiatric outpatient service, 718

Pancreas, fine needle aspiration of, **401–427**
adenocarcinoma, ductal, 407–409
poorly differentiated, 410–412
undifferentiated, 412
well-differentiated, 410
adenosquamous carcinoma, 412, 414
cyst fluid analysis in, 421–423
cystic lesions, 416–423
endocrine tumors, 414–416, 421
imaging for, 401–404
mucinous cystic neoplasms, 417–420
normal cytology, 404, 406
pancreatitis, 406–407
papillary neoplasms, 385
pseudopapillary tumor, 420
serous cystadenoma, 417
Pancreatitis, fine needle aspiration of, 406–407
Papillary neoplasms, fine needle aspiration cytology of, **373–399**
biliary tree, 385
breast, 374–377
central nervous system, 389
kidney, 385–387, 438–439
liver, 385, 393
lung, 383–384, 392–393
lymph nodes, 390–391
mediastinum, 384, 392–393
metastatic, 390–394
ovary, 388–389
pancreas, 385
parathyroid glands, 382
salivary glands, 382–383
skeletal system, 391–392
skin, 394
soft tissue, 394
technical considerations in, 373–374
testis, 388
thyroid gland, 377–382, 471–473
Paradoxic undressing, in hypothermia, 87
Paranasal sinuses, forensic radiology of, 219
Parathyroid glands, fine needle aspiration of, cysts, 465
papillary neoplasms, 382
Particle beam interface, with liquid chromatography-mass spectrometry. See *Liquid chromatography-mass spectrometry.*
Particulates, intrapulmonary, forensic pathology in, 250–252
Patch tests, sweat, for drugs, in psychiatric outpatient service, 717
Patterned abrasions, examination of, 341
Pediatric patients, abuse of, forensic radiology in, 225–229
autopsy of, 323–325
head trauma in, brain contusions in, 47
from abuse, 58–59
malignant edema/hyperemia in, 56
lymphoma in, 553–554
mineral-associated cirrhosis in, **665–671**
sudden death in. See *Sudden death.*
Pelvis, radiology of, in forensic pathology, 210, 221
Penetrating fractures, of skull, 40
Pepper spray, death from, 19–20
Peripheral nerve sheath tumors, malignant, fine needle aspiration of, 521–522
Personal effects, in postmortem identification, 116–117
Petechiae, in neck compression, 10
Phenanthrene, as diesel exhaust marker, 775
Phentermine, identification of, gas chromatography-mass spectrometry in, 643–644
Pheochromocytoma, fine needle aspiration of, 452–454
Photogrammetry, in forensic pathology, 176
Photographs, comparison with, in postmortem identification, 118
digital, processing of. See *Image processing.*
superimposition of, in postmortem identification, 126
Pixels, in image processing, 158
Plasma source emission spectrometry, in trace element analysis, 618–619
Pleomorphic liposarcoma, fine needle aspiration of, 510–511
Pleural disease, asbestos-related, 256
Pneumoconiosis, coal workers', forensic pathology in, 258–259
from diesel exhaust, 773–774
Pneumonia, in pediatric patients, sudden death in, 331–332
Point-of-care tests, in drug detection, in psychiatric outpatient service, 714–715
Police investigations, pathology studies in. See *Forensic pathology.*
Polymerase chain reaction, in cytopathology, in situ, 572–573
microdissection with, 573–579
in forensic pathology, 72
in postmortem identification, 128–130
Pontomedullary avulsion, 47
Poppy seed ingestion, positive opiate test in, 717

Population ancestry determination, in forensic radiology, 211, 214
Postmortem identification, **115–137**
anthropology in, 123–125
checklist for, 137
circumstantial evidence in, 119
dentition in, 120–122
DNA tests in, 127–131
documents on body in, 116
facial reconstruction in, 125–126
fingerprints in, 119–120
footprints in, 120
hair characteristics in, 126–127
importance of, 115–116
in mass fatality incidents, 132–133
laboratory tissue tests in, 127–131
legal significance of, 115–116
medical records comparison in, 122
missing persons registries in, 131–132
of ancient remains, 124
personal effects in, 116–117
photograph comparisons in, 118
photograph superimposition in, 126
radiology in, 122–123
scars in, 118
tattoos in, 118
visual recognition in, 117–118
Powder tattooing, in rifle wounds, 193, 197
Pregnancy, pulmonary disease in, forensic pathology in, 244–248
Primitive neuroectodermal tumors, fine needle aspiration of, 522–523
Prison, death in. See *Death, in custody.*
Professional practice standards, of American Academy of Forensic Sciences, 633–634
Proficiency testing, in drug testing programs, 802–803
Progesterone receptors, immunoperoxidase technique for, 361
Proliferative fasciitis, fine needle aspiration of, 536
Pseudopapillary tumors, pancreas, fine needle aspiration of, 420
Psychiatric outpatient service, drug abuse testing in, **713–726**
adulterant effects in, 720–721
amphetamines, 719
analytical techniques for, 714–715
benzodiazepines, 718
cocaine, 718–719
confirmation in, 720
in clinical practice, 721
marijuana, 718
methadone, 719–720
opiates, 717–718
specimen types for, 715–717
Public health surveillance systems, forensic pathologist participation in, 30–31
Pulmonary arteries, arteriopathy of, in pulmonary hypertension, forensic pathology in, 245–246
thromboembolic disease of, forensic pathology in, 242–244
Pulmonary disease, forensic pathology in, **241–262**
in air embolism, 247–248
in amniotic fluid embolism, 246–247
in asbestos-related disease, 254–258
in asthma, 248
in clotting, 242
in coal workers' pneumoconiosis, 258–259
in cocaine use, 248–250
in embolism, 242, 246–248
in particulate inhalation, 250–252
in pediatric patients, 327, 331–332
in pregnancy, 244–248
in pulmonary hypertension, 245–246
in sudden infant death syndrome, 252–254
in thrombosis, 242–244
Pulmonary hemorrhage, in infants, epidemiologic investigation of, 26–27
Pulmonary hypertension, in pregnancy, forensic pathology in, 245–246
Pyelonephritis, xanthogranulomatous, fine needle aspiration of, 434–435

Quadrupole filters, in gas chromatography-mass spectrometry, 637–638

Race determination, in forensic pathology, 211, 215
Radiation, in heat transfer, 79
Radiochemical neutron activation analysis, of trace elements, 620
Radiology, forensic, **203–240**
administrative aspects of, 237
education on, 235
historical perspective of, 203–208
in abuse, 225–231
child, 225–229
elder, 230
human rights, 230–231
spousal, 227, 230
in gunshot wounds, 231–232
in identity determination, 208–222
anthropologic parameters in, 208–215
in mass casualty situations, 221–222
of individual remains, 216–218
tissues used in, 218–221

Radiology *(Continued)*
in injury evaluation, 222–225
from foreign bodies, 225
osseous, 223–225
in litigation, civil, 234–235
criminal, 232–234
in postmortem identification, 122–123
in rifle wounds, 197
research on, 235–237
Rapamycin, in transplantation, toxicology of, 761–762
Rape, DNA analysis in, 72–73
Rebreathing, sudden infant death syndrome and, 253–254
Recreational drugs, **727–746**
amphetamines and analogues, 730, 737, 741–744
flunitrazepam, 730, 732–737
gamma-hydroxybutyrate, 728–732
3,4-methylenedioxyamphetamine (MDA, love drug), 730, 740–741
3,4-methylenedioxyethylamphetamine (MDEA), 730, 741–742
3,4-methylenedioxymethamphetamine (MDMA, ecstasy), 730, 737–739
Reed-Sternberg cells, in Hodgkin's lymphoma, 546–547
Rejection, in transplantation, immunosuppressive drugs for. See *Immunosuppressive drugs.*
Religious beliefs, autopsies and, 144–147
Remains, identification of. See *Postmortem identification.*
Renal cell carcinoma, fine needle aspiration of, 385–386, 436–442
Renal pelvis, fine needle aspiration of, 431, 447–448
Research, on forensic radiology, 235–237
Research and Special Programs Administration, drug testing program of, 786–787
Respiratory disease. See also *Pulmonary disease.*
from diesel exhaust, 773–774
in pediatric patients, sudden death in, 327–328, 331–332
Respiratory syncytial virus infections, in pediatric patients, sudden death in, 332
"Responsible person" position, in drug testing programs, 270
Restraint, death in, certification of, 18–19
in catecholamine rush, 15–16
in drug use, 17–18
in excited delirium, 16–17
in lethal catatonia, 16
in natural disease, 17–18
in neck holds, 9–12
in restraint asphyxia, 13–15
Restriction fragment length polymorphism analysis, in forensic pathology, 71–73
in postmortem identification, 128–130
Resuscitation, in death in custody, injuries from, 4–5
Retinal hemorrhage, in shaken baby syndrome, 58
Retraction balls, axonal, in head trauma, 51–52
Reye syndrome, sudden death in, 330–331
Rhabdoid tumor, fine needle aspiration of, 445, 527–528
Rhabdomyoma, fine needle aspiration of, 525–526
of heart, in pediatric patients, sudden death in, 326
Rhabdomyosarcoma, fine needle aspiration of, 526–527
Rhein Main Air Force Base car bombing, 102
Rifle wounds, **189–201**
bullet characteristics in, 190–191
characteristics of, 192–197
contact, 192–193
distant, 195–197
epidemiology of, 189
from assault rifles, 199–201
in suicides, 199
intermediary targets in, 198–199
intermediate-range, 193, 195
permanent wound track in, 191–192
powder tattooing in, 197
radiology of, 197, 231–232
rifle construction and, 189–190
temporary cavity in, 191–192
theories of, 191–192
Ring fractures, of skull, 41
Röntgen, William Conrad, 203–206
Roofies (flunitrazepam), 730, 732–737

Salivary glands, papillary neoplasms of, fine needle aspiration of, 382–383
Sarcoma, fine needle aspiration of, alveolar soft part, 533–535
angiosarcoma, 531
clear cell, 533
dermatofibrosarcoma protuberans, 517
epithelioid, 532–533
fibrosarcoma, 514–516
Kaposi's, 531–532
leiomyosarcoma, 444, 528–530
liposarcoma, 509–513
myxoid liposarcoma, 510, 512
neurofibrosarcoma, 521–522
rhabdomyosarcoma, 526–527
synovial, 524–525
Sarcomatous renal cell carcinoma, fine needle aspiration of, 441–442

Scale-space representations, in image processing, 172
Schwannoma, fine needle aspiration of, benign, 518–520
malignant, 521–522
Selected ion monitoring, gas chromatography-mass spectrometry, in urine drug testing, 641–642
Selenium, in nutrition, 679–681
Sepsis, in asplenia, in pediatric patients, sudden death in, 333
Serologic tests, in postmortem identification, 127
Serous cystadenoma, fine needle aspiration of, 417
Sex crimes, recreational drug use in. See *Recreational drugs.*
Sex determination, in forensic radiology, 210–211
Sexual activity, evaluation for, in jail death, 8
Shaken baby syndrome, 58–59
Shaken impact syndrome, in child abuse, 59
Sharp injuries, patterns of, 344–349
autopsy in, 348–349
chop, 348
incised, 347–348
stab, 345–347
Shivering, in thermoregulation, 78, 86
Short tandem repeat measurement, in forensic pathology, 72
SIDS (sudden infant death syndrome), forensic pathology in, 252–254, 333–334
Simulation, computer, in forensic pathology, 177–178
Sinuses, radiography of, in postmortem identification, 123
Sirolimus (rapamycin), in transplantation, toxicology of, 761–762
Skeletal system, fine needle aspiration of, papillary neoplasm metastasis, 391–392
radiology of, in forensic pathology, in identification, 219–221
in injury evaluation, 223–225
Skin, appearance of, in cold exposure, 87
papillary neoplasms of, fine needle aspiration of, 394
Skull, facial reconstruction from, computer graphics in, 74
in postmortem identification, 124–126
fractures of, 40–41
in child abuse, 59
radiology of, in forensic pathology, 210, 212–214, 219
Sleep, sudden infant death syndrome and, 252–254
Small cell carcinoma, fine needle aspiration of, 365
anaplastic, 443–444, 448
Small cell lymphomas, fine needle aspiration of, extranodal marginal zone, 552
follicular center, 550–551
lymphoblastic, 553–554
lymphocytic, 548–549
lymphoplasmacytic, 550
mantle cell, 551–552
noncleaved cell (Burkitt), 554–555
Smooth muscle tumors, fine needle aspiration of, 528–530
Smuggling, forensic radiology in, 233
Social service agencies, urine drug testing for, **705–711**
Society of Forensic Toxicologists, guidelines of, 264–276
Sodium brequinar, in transplantation, toxicology of, 761
Soft tissue, radiology of, in forensic pathology, 218–219
Soft-tissue lesions, fine needle aspiration of, **507–540**
alveolar soft part sarcoma, 533–535
angiosarcoma, 531
benign fibrous histiocytoma, 516
clear cell sarcoma, 533
dermatofibrosarcoma protuberans, 517
elastofibroma, 537
epithelioid sarcoma, 532–533
fibromatosis, 513–514
fibrosarcoma, 514–516
ganglion cyst, 537
granular cell tumor, 520–521
hemangioma, 530–531
Kaposi's sarcoma, 531–532
leiomyoma, 528
leiomyosarcoma, 528–530
lipoma, 508–509
liposarcoma, 509–513
malignant fibrous histiocytoma, 517
malignant peripheral nerve sheath tumors, 521–522
myxoma, 536–537
neurofibroma, 518–520
nodular fasciitis, 535–536
papillary neoplasms, 394
primitive neuroectodermal tumors, 522–523
proliferative fasciitis, 536
rhabdoid tumor, 527–528
rhabdomyoma, 525–526
rhabdomyosarcoma, 526–527
schwannoma, 518–520
smooth muscle tumors, 528–530
synovial sarcoma, 524–525
tendon sheath tumors, 524

Solids probe technique, in gas chromatography-mass spectrometry, in urine drug testing, 645
Sovereign immunity defense, in litigation. See *Litigation, against medical examiners.*
Specimen collection, in drug testing programs, 791–792
in fine needle aspiration, 358–362
Spectrometry. See also *Mass spectrometry.*
in trace element analysis, **615–629**
atomic absorption, 616–618
atomic emission, 618–619
inductively coupled plasma-mass spectrometry, 620–626
neutron activation, 619–620
Splenectomy, sepsis after, sudden death in, 333
Spousal abuse, forensic radiology in, 227, 230
Squamous cell carcinoma, fine needle aspiration of, 364, 448
Stab wounds, 345–347
Standards of professional practice, of American Academy of Forensic Sciences, 633–634
Stature, determination of, from skeletal examination, 125
in forensic radiology, 211
Stress, cold, 84–85
heat, 81–82
Stroke, heat, 82–83
Subarachnoid hemorrhage, in head trauma, 42
Subareolar papillomatosis, fine needle aspiration of, 374–375
Subdural empyema, in head trauma, 57
Subdural hematoma, in trauma, 47–50, 59
Substance abuse. See *Drug abuse.*
Substance Abuse and Mental Health Services Administration, 784
forensic toxicology guidelines of, 265
Sudden death, in pediatric patients, **323–338**
autopsy in, 323–325
in asplenia, 333
in cardiovascular disorders, 325–327
in central nervous system lesions, 328–329
in gastrointestinal disorders, 329–330
in infections, 331–332
in metabolic conditions, 330–331
in respiratory disease, 327–328
sudden infant death syndrome, 27, 252–254, 333–334
Suicide, by hanging, 5–8
in jail, 5–7
with rifles, 199
with sharp objects, 347
Sulfite oxidase, molybdenum and, 681
Superoxide dismutases, copper and, 674–676
Surveillance systems, public health, forensic pathologist participation in, 30–31
Sweat, in drug testing, for psychiatric outpatient service, 717
Sweating, in thermoregulation, 80
Swelling, cerebral, in head trauma, 56
Synovial sarcoma, fine needle aspiration of, 524–525

Tacrolimus (FK 506), in transplantation, toxicology of, 759–761
Tandem mass spectrometry, in forensic toxicology, 274
in urine testing, 646–648
Tattoos, in postmortem identification, 118
powder, in rifle wounds, 193, 197
Tau protein, in aluminum-induced neurofibrillary degeneration, 691–692, 694
Technology, for forensic science, **65–76**
automated fingerprint identification system, 66–68
computer graphics, 73–74
DNA data base, 71–73
firearms identification information systems, 68–71
informatics, 74–75
Teeth, radiology of, in forensic pathology, 218
Temperature, extreme, injuries from. See *Thermal injuries.*
Tendon sheath tumors, giant cell, fine needle aspiration of, 524
Ten-print-based fingerprint identification systems, 67
Tensile strain, skull fracture in, 40
Terrorism, forensic radiology in, 230–231
pathology of, **99–114**
airport shootings, 111
bombings, 100–108
hijacking murders, 109–110
retaliation murders in Beirut, 111–112
Testis, papillary neoplasms of, fine needle aspiration of, 388
Tetrahydrocannabinol use, forensic toxicology in, driving and, 269
specimen adulteration in, 272–273
testing for, in psychiatric outpatient service, 718
Thermal injuries, **77–90**
in cold exposure, 84–88
cold stress, 84–85
death in, 87–88
illnesses, 85–87

in heat exposure, 81–84
death in, 83–84
epidemiologic investigation of, 27, 83–84
heat stress, 81–82
illnesses in, 82–83
thermoregulation physiology and, 77–81
Three-dimensional visualization, in image processing, 176–177
Thrombosis, of pulmonary arteries, forensic pathology in, 242–244
Thyroglossal duct cyst, fine needle aspiration of, 381, 464
sudden death in, 328
Thyroid gland, fine needle aspiration of, **461–482**
anaplastic carcinoma, 474–475
complications of, 462
cysts, 464–465
diagnostic schema for, 462–464
follicular neoplasms, 468–470
Hurthle cell neoplasms, 381–382, 470–471
lymphoma, 475–476
medullary carcinoma, 474
metastasis, 476
nodular goiter, 467–468
normal cytology, 464
papillary neoplasms, 377–382, 471–473
technique for, 462
thyroiditis, 465–467
Thyroiditis, fine needle aspiration of, 465–467
Tingible-body macrophages, in lymph node, 544
Torture, forensic radiology in, 230–231
Toxicology, forensic, **263–278**
accreditation in, 264–267
analytic techniques for, 271–275
definition of, 263
for Employee Assistance Program, **747–753**
for social service agencies, **705–711**
gas chromatography/mass spectrometry techniques in, for urine testing, **631–649**
in cocaine use, **699–704**
in death in custody, 3, 17–18
in driving under the influence of drug cases, 268–269
in injury, 344
liquid chromatography/mass spectrometry techniques in, **651–663**
postmortem analyte distribution in, 267–268
results interpretation in, 267–271
urine analysis in, 269–270, 272–274
in drug abuse, **781–803**
for Employee Assistance Program, **747–753**
in psychiatric outpatient service, **713–726**
recreational, **727–746**
in metal-associated cirrhosis of infants, **665–671**
of aluminum, in experimental encephalomyelopathy, **687–698**
of diesel exhaust, **767–779**
of immunosuppressive drugs, **755–765**
of trace elements, **673–685**
spectrometric analysis in, **615–629**
Trace elements, in nutrition, **673–685**
spectrometric analysis of, **615–629**
atomic absorption, 616–618
atomic emission, 618–619
inductively coupled plasma-mass spectrometry, 620–626
neutron activation, 619–620
Transitional cell carcinoma, fine needle aspiration of, 387, 447
Transplantation, immunosuppressive drugs in. See *Immunosuppressive drugs, in transplantation.*
kidney, allograft rejection in, fine needle aspiration of, 446–447
Trauma. See *Injuries.*
2,4,5-Trimethoxyamphetamine, as recreational drug, 742
Triple test, in breast carcinoma, 603
TWA Flight 840 bombing, 103–108
TWA Flight 847 hijacking, murder in, 109

Ultrasonography, in fine needle aspiration, liver, 484
pancreas, 402–404
United States Department of Health and Human Services, toxicology guidelines of, 264–265
Urine testing, for drugs, amphetamines, 719
cocaine metabolites, 719
for psychiatric outpatient service, 715
for social service agencies, **705–711**
gas chromatography-mass spectrometry in. See *Gas chromatography-mass spectrometry.*
in workplace. See *Drug testing programs.*
interpretation of, 269–270, 272–274
marijuana, 718
methadone, 719–720
opiates, 717
specimen adulteration and substitution in, 720–721, 795–796
for trace elements, spectrometric analysis of. See *Trace elements, spectrometric analysis of.*

Urine testing *(Continued)*
in diesel exhaust exposure, 776

Vagal reflex, in carotid sinus stimulation, death in, 12–13
Variable number of tandem repeat measurement, in forensic pathology, 71–72
Vascular injury, diffuse, in head trauma, 55
Vascular malformations, of brain, in pediatric patients, sudden death in, 328
Vascular tumors, fine needle aspiration of, 530–532
Venous embolism, air, forensic pathology in, 247–248
Vertebral arteries, injury of, subarachnoid hemorrhage in, 42
Violence, catecholamine rush in, 15–16
Visual recognition, in postmortem identification, 117–118
Volvulus, in pediatric patients, sudden death in, 329

Water, cold, hypothermia in, 86
Water-biast injuries, 100
Weapons, injuries from, chop, 348
guns. See also *Rifle wounds.*
radiology in, 197, 231–232
sharp. See *Sharp injuries.*
Web sites, for forensic pathology, 95–96
Wet bulb-globe temperature index, 81
Whiplash shaken baby syndrome, 58–59
Whole body cooling, 86–87
Wilms' tumor, fine needle aspiration of, 442–443
Wilson's disease, copper metabolic defects in, 675–676
Workplace, diesel exhaust exposure in, **767–779**
drug testing in. See *Drug testing programs; Toxicology, forensic.*
substance abuse management in, Employee Assistance Program for, **747–753**
Wounds, chop, 348
defense, 343
gunshot. See also *Rifle wounds.*
radiology in, 197, 231–232
incised, 347–348
stab, 345–347

Xanthine oxidase, molybdenum and, 681
Xanthogranulomatous pyelonephritis, fine needle aspiration of, 434–435

Zeno's Forensic Page news-group, 94
Zinc, in nutrition, 677–679